Chapter 18: MP&M Benefit / Cost Comparison

Introduction

The preceding Chapters 12 through 16 provided quantitative and qualitative assessments of the expected benefits to society from reduced MP&M effluent discharges under the proposed regulation. Chapter 11 assessed the regulation's expected social costs. This chapter sums the estimated values for the benefit categories that EPA was able to monetize, and compares the aggregate benefits estimate with the estimate of social costs.

Chapter Contents:

18.1 Social Costs

As discussed in Chapter 11, EPA estimated three categories of social cost for the proposed regulation:

- the cost of society's economic resources used to comply with the proposed regulation,
- the cost to governments of administering the proposed regulation, and
- the social costs of unemployment resulting from the regulation.

Summing these social cost accounts results in total social costs ranging from $2,034 to $2,113 million annually (1999$). The midpoint estimate of social costs for the proposed option equals $2,073 million (1999$).

The social cost estimates do not explicitly estimate losses in consumers' and producers' surpluses resulting from the changed quantity of goods and services sold in affected product markets. Instead, EPA developed an upper-bound estimate of social costs by including compliance costs for facilities predicted to close due to the rule. This approach results in an upper-bound estimate of the social costs of compliance, since the lost value incurred by closing facilities is presumably less than the estimated cost of compliance .[1]

[1] Including costs for regulatory closures in effect calculates the social costs of compliance incurred if every facility continued to operate post-regulation. Calculating costs as if all facilities continue operating will overstate social costs because some facilities find it more economic to close.

18.2 Benefits

EPA was able to develop a partial monetary estimate of expected benefits for the proposed regulation in three categories: human health, water-based recreation (including nonuse value), and economic productivity benefits. Summing the monetary values reported in the preceding chapters across these categories results in total monetized benefits of $1,284 to $3,833 million (1999$) annually for the proposed rule (see Table 18.1). The midpoint estimate of monetized benefits for the proposed rule equals $2,396 million (1999$). As noted in Chapter 12, this benefit estimate is necessarily incomplete because it omits numerous mechanisms by which society is likely to benefit from reduced effluent discharges from the MP&M industry. Examples of benefit categories not reflected in this monetized estimate include:

- non-lead and non-cancer related health benefits,
- improved aesthetic quality of waters near discharge outfalls,
- benefits to wildlife and to threatened or endangered species,
- tourism benefits, and
- reduced costs of drinking water treatment.

18.3 Comparing Monetized Benefits and Costs

EPA cannot perform a complete cost-benefit comparison because not all of the benefits resulting from the proposed regulatory alternative can be valued in dollar terms. Table 18.1 shows that combining the estimates of social benefits and social costs yields an estimate of net monetizable benefits ranging from negative $809 million to positive $1,752 million annually (1999$) at the national level. Comparing the midpoint estimate of social costs with the midpoint estimate of monetized benefits results in a net benefit of $311 million (1999$). The lack of a comprehensive benefits valuation limits this assessment of the relationship between costs and benefits of the proposed rule. EPA believes that the benefits of regulation, even in the low-estimate case, would likely exceed the social costs if all of the benefits of regulation could be quantified and monetized.

Table 18.1: Comparison of National Annual Monetizable Benefits to Social Costs: Proposed Rule (millions of 1999$)

Benefit and Cost Categories	Low	Mid	High
Benefit Categories			
Reduced Cancer Risk from Fish Consumption	$0.3	$0.3	$0.3
Reduced Cancer Risk from Water Consumption	$13.0	$13.0	$13.0
Reduced Risk from Exposure to Lead	$28.0	$28.0	$28.0
Enhanced Water-Based Recreation[a]	$960.6	$1,520.7	$2,218.7
Nonuse Benefits	$240.2	$760.3	$1,464.3
Avoided Sewage Sludge Disposal Costs	$61.1	$61.3	$61.5
Total Monetized Benefits	**$1,303.2**	**$2,383.6**	**$3,785.8**
Cost Categories			
Resource Costs of Compliance	$2,033.7	$2,033.7	$2,033.7
Costs of Administering the Proposed Regulation	$0.1	$0.3	$0.9
Social Costs of Unemployment	$0	$39.0	$78.0
Total Monetized Costs	$2,033.9	$2,073.0	$2,112.6
Net Monetized Benefits (Benefits Minus Costs)[b]	**($809.4)**	**$310.6**	**$1,751.9**

a. EPA adjusted the value of recreational fishing benefits to avoid double counting the benefits from cancer case reductions resulting from avoided consumption of contaminated fish tissue. The adjusted value is simply the difference between the estimated value of recreational fishing benefits and the value of benefits from reducing the cancer risk caused by fish consumption.
b. EPA calculated the low net benefit value by subtracting the high value of costs from the low value of benefits, and calculated the high net benefit value by subtracting the low value of costs from the high value of benefits. The mid value of net benefits is the mean value of benefits less the median value of costs.
Source: U.S. EPA analysis.

18.4 Comparing Monetized Benefits and Costs at the Sample Facility Level

Extrapolating from sample facility results to national results can introduce uncertainty into the analysis for both the cost and the benefits estimates. EPA therefore compared costs and benefits for the sample facilities alone, basing the sample results on known facility and benefit pathway characteristics. Table 18.2 presents the results of this analysis. EPA found that the relationship between benefits and costs for sample facilities alone are similar to that found in the national analysis. Specifically, in both analyses the low estimate for net benefits is negative while the midpoint and high estimates for net benefits are positive. This similarity in the relationship between benefits and costs in the two analyses, which is also matched by results from the Ohio case study (Chapter 22), increases EPA's confidence in its extrapolation of results to the national level.

Table 18.2: Comparison of Annual Monetizable Benefits to Social Costs for Sample Facilities: Proposed Rule (thousands of 1999$)

Benefit and Cost Categories	Low	Mid	High
Reduced Cancer Risk from Fish Consumption	$17.4	$17.4	$17.4
Reduced Cancer Risk from Water Consumption	$1,057.1	$1,057.1	$1,057.1
Reduced Risk from Exposure to Lead	$2,585.0	$2,585.0	$2,585.0
Enhanced Water-Based Recreation	$68,990.4	$108,803.9	$158,121.1
Nonuse Benefits	$17,247.6	$54,402.0	$104,359.9
Avoided Sewage Sludge Disposal Costs	$7,532.1	$7,532.4	$7,532.7
Total Monetized Benefits	**$97,429.6**	**$174,397.8**	**$273,673.2**
Total Monetized Costs[a]	**$121,392.9**	**$121,392.9**	**$121,392.9**
Net Monetized Benefits (Benefits Minus Costs)[b]	**($23,963.3)**	**$53,004.9**	**$152,280.3**

a. Total monetized costs represent the resource cost of compliance only. This analysis does not include the cost of administering the proposed regulation and the social cost of unemployment. Their relatively small size makes their exclusion unlikely to affect the conclusions that can be drawn from this analysis.
b. EPA calculated the low net benefit value by subtracting costs from the low value of benefits, and calculated the high net benefit value by subtracting costs from the high value of benefits.
Source: U.S. EPA analysis.